

Distributional Records for Gastropods and Sphaeriid Clams of the Kentucky and Licking River and Tygarts Creek Drainages, Kentucky

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ABSTRACT.— Collections from 50 sites in the Kentucky and Licking River drainages and from Tygarts Creek, direct tributary of the Ohio River in eastern Kentucky, produced records of 2 genera and 7 species of sphaeriid clams, and of 6 families, 12 genera, and 22 species of gastropods. *Sphaerium corneum* and *Lymnaea stagnalis* are reported from Kentucky for the first time.

INTRODUCTION

In a recent attempt to generate a list of the Endangered, Threatened and Rare plants and animals of Kentucky, the authors and associates (Branson et al. 1981) were hampered by the relative paucity of published information on aquatic gastropods and sphaeriid clams. With the exception of a long series of papers on pleurocerids by Calvin Goodrich (see citations in Bickel 1967 and Branson 1972), very few papers have dealt with the Kentucky molluscan fauna. There are many broad hiatuses in our knowledge of distribution patterns, particularly in the Kentucky, Licking, and Green River drainages, and in the various streams directly tributary to the Ohio River. The present contribution fills some of the gastropod and sphaeriid clam distributional gaps in the Kentucky and Licking rivers, and in Tygarts Creek, a clear tributary of the Ohio River in eastern Kentucky.

COLLECTING STATIONS

The 50 numbered collecting stations and dates of sampling are given below. SR = State Road, US = U. S. Highway, CR = County Road, and KR = Kentucky Highway.

KENTUCKY RIVER DRAINAGE

1. Kentucky River, Frankfort, Franklin Co.; 5 November 1980.
2. Kentucky River, Lock and Dam 4, Franklin Co.; 20 October 1980.
3. Kentucky River, 0.6 km downstream from Fort Boonesborough State Park, 12.9 km SW Winchester, Madison Co.; 11 October 1980.
4. Kentucky River at mouth of Benson Creek, just above Lock and Dam 4, Franklin Co.; 20 October 1980.
5. Kentucky River, Lock and Dam 8 at CR 1268, Jessamine Co.; 16 June 1973.

6. Kentucky River, 12 km NE Frankfort on US 127 and 3.2 km W Steeles Mill Rd., Franklin Co.; 20 October 1980.
7. Middle Fork of Kentucky River at SR 30, 16.1 km SSE Jackson, Breathitt Co.; 1 July 1972.
8. South Fork of Kentucky River, Oneida, Clay Co.; 18 July 1970.
9. South Fork of Kentucky River at SR 11, 1.2 km S Clay and Owsley cos. line in Clay Co.; 1 August 1970.
10. South Fork of Kentucky River at SR 11, 0.4 km N Clay Co. line in Owsley Co.; 13 September 1970.
11. South Fork of Kentucky River, Booneville, Owsley Co.; 16 January 1971.
12. South Fork of Kentucky River, Eversole, Owsley Co.; 19 June 1971.
13. South Fork of Kentucky River, 0.5 km N Booneville, CR 1475, Owsley Co.; 6 June 1971.
14. Middle Fork of Kentucky River, Tallega, Lee Co.; 24 June 1972.
15. Middle Fork of Kentucky River, Hoskinston, Leslie Co.; 17 November 1973.
16. Dix River at KR 52, Hedgeville, Boyle and Garrard cos.; 11 October 1980.
17. Elkhorn Creek at CR 1900, 4.8 km NNE Frankfort, Franklin Co.; 19 October 1980.
18. Elkhorn Creek, Frankfort, Franklin Co.; 19 October 1980.
19. Boone Creek at Grimes Mill Road, 19.2 km N Richmond, Fayette Co.; 2 November 1980.
20. Red River, Hazel Green, Wolfe Co.; 15 October 1980.
21. Small pond, Central Kentucky Wildlife Management Area, 2 km SE Kingston, Madison Co.; 9 September 1980.
22. Silver Creek at Barnsmill Road, 9.6 km W Richmond, Madison Co.; 25 October 1980.
23. Silver Creek at SR 52, 19 km E Richmond, Estill Co.; 16 March 1966.
24. Elkhorn Creek at KR 460, 1.2 km E Frankfort, Franklin Co.; 19 September 1980.
25. Elkhorn Creek at KR 227, 0.9 km W Georgetown, Scott Co.; 11 September 1980.
26. Cave Run at confluence with Elkhorn Creek, 3.5 km W Lexington, Fayette Co.; 10 September 1980.
27. Paint Lick Creek, 0.3 km above mouth of Dry Run Creek, 1.0 km SE Paintlick, Garrard Co.; 8 September 1980.
28. Lake Arlington, 0.25 km N Richmond, Madison Co.; 21 March 1972.
29. Farm pond, Eastern Kentucky University, Richmond, Madison Co.; 23 March 1972.

30. Eagle Creek at KR 437, 0.7 km E Sparta, Gallatin Co.; 12 September 1979.
31. Sturgeon Creek at confluence with Kentucky River, Heidelberg, Lee Co.; 3 July 1980.
32. Little Sturgeon Creek at confluence with Sturgeon Creek, 3.2 km NW Travellers Rest, Owsley Co.; 22 January 1972.
33. Muddy Creek at Doylesville Rd., 1.6 km SE Doylesville, Madison Co.; 16 September 1972.
34. Sinking Creek at SR 52, 3.6 km E Irvine, Estill Co.; 16 March 1966.
35. Goose Creek at SR 718, 0.5 km N Bright Shade, Clay Co.; 3 March 1970.
36. Red Bird Creek at SR 99, 1.0 km N Creeksville, Clay Co.; 23 May 1970.
37. Red Bird Creek at mouth of Little Double Creek and SR 99, Clay Co.; 30 May 1970.
38. Bullskin Creek at CR 1482, 0.5 km E Oneida, Clay Co.; 6 June 1970.
39. Sexton Creek at confluence with South Fork of Kentucky River, 10.5 km S Booneville, SR 11, Owsley Co.; 27 February 1971.
40. Island Creek at SR 11, Conklin, Owsley Co.; 6 March 1971.
41. Buck Creek at confluence with South Fork of Kentucky River, Owsley Co.; 10 April 1971.
42. Bear Branch, Nobel, Breathitt Co.; 26 April 1969.
43. Greasy Creek, 1.3 km E Asher, Leslie Co.; 23 October 1976.

LICKING RIVER DRAINAGE

44. Licking River at US 60, 3 km SE Farmers, Bath and Rowan cos.; 23 October 1980.
45. Licking River, Butler, Pendleton Co.; 4 August 1964.
46. North Fork of Licking River at SR 165, 5.0 km N Mount Olivet, Robertson Co.; 12 October 1974.
47. Fish ponds, Minor E. Clark Fish Hatchery, Morehead, Rowan Co.; 6 September 1980.
48. Slate Creek at US 60, 3.2 km E Owingsville, Bath Co.; 10 November 1973.
49. Fox Creek, Grange City, Fleming Co.; 10 November 1973.

TYGARTS CREEK DRAINAGE

50. Tygarts Creek at SR 7, 8 km NW Greenup, Greenup Co.; 5 October 1968.

ANNOTATED LIST

The following list contains data for 2 genera and 7 species of

sphaeriids and 6 families, 12 genera and 22 species of aquatic snails. The number of specimens obtained at each site is provided in parentheses following the collecting site number. All specimens were deposited in the Museum of Zoology, Eastern Kentucky University.

BIVALVIA: SPHAERIDAE

The characters used by Clarke (1973) and Burch (1975) to separate *Sphaerium* and *Musculium* demonstrate as many relationships as they do differences. Hence, we follow Herrington (1962) in relegating the genus *Musculium* to subgeneric status under *Sphaerium*.

Sphaerium corneum (Linnaeus). Collections: 48 (1). The habitat consisted of fine sand admixed with small quantities of silty materials. Considered an exotic by Herrington (1962), this species heretofore has not been reported from Kentucky waters. A single specimen is not very conclusive evidence, particularly because aberrant specimens of *S. nitidum* Westerlund are easily confused with this species. Additional field work needs to be accomplished in order to ascertain the status of *S. corneum* in Kentucky.

Sphaerium lacustre (Muller). Collections: 28 (4). Specimens were obtained by dredging. The distribution of this and other pond-dwelling sphaeriids is poorly known in Kentucky, principally because of inadequate sampling.

Sphaerium fabale Prime. Collections: 11 (2), 31 (12), 43 (3), 46 (15), 49 (1). This species is not uncommon in clean upland tributaries and main rivers in relatively shallow situations with an abundance of rocks and gravel. Branson and Batch (1981 and 1982) reported thriving populations of this small clam in Dix and Red rivers, both major tributaries of the Kentucky River.

Sphaerium simile Say. Collections: 8(1), 11 (1), 14 (10), 32 (2). This rather heavy-shelled form is not uncommon in the Kentucky River drainage (Branson and Batch 1981), but apparently is scarce in most of the Licking River.

Sphaerium striatinum (Lamarck). Collections: 13 (1), 22 (3), 33 (1), 37 (1), 39 (1), 42 (5), 44 (1), 45 (1), 48 (22), 49 (1), 50 (2). The most widespread and abundant sphaeriid in Kentucky, this species sometimes produces prodigious populations in clean (lacking silt), rocky, vegetated riffles.

Sphaerium transversum (Say). Collections: 29 (6). This species was taken in dredge samples from soft mud in water approximately 2 m deep.

Pisidium compressum Prime. Collections: 28 (1), 29 (3). Both collections came from mud-bottom ponds. All members of the genus *Pisidium* are poorly known in Kentucky because of a dearth of collecting.

GASTROPODA: PROSOBRANCHIA

Many taxonomic problems still exist among the Pleuroceridae, problems that must be resolved before there is any stability in the family at the species level. Not all of these problems can be resolved by means of shell morphology. Instead, investigators must rely on data from reproductive behavior, particularly the method of egg deposition, and from newer techniques such as electrophoresis. In particular, there is a plethora of problems needing resolution in the Cumberland and Green rivers of Kentucky and adjacent Tennessee. To complicate matters, several of the species are becoming threatened as we extend domination over progressively larger and larger sections of those streams (Branson et al. 1981). However, in spite of these problems, most of the genera treated in Goodrich (1940) and elsewhere, with some exceptions, are relatively stable and recognizable categories. The generic designations used herein are principally those of Goodrich (1940).

Pleuroceridae

Lithasis obovata (Say). Collections: 1 (1), 2 (10), 27 (2), 45 (1). Not a common species in general riverine collections from Kentucky, this snail is listed as of Special Concern (Branson et al. 1981). There is an apparently healthy population in the pool behind Lock 4 (our Station 2) on the Kentucky River. There is a move by the U.S. Army Corps of Engineers to abandon management and operation of the lock and dam system, although some of the county governments along the river have proposed to take over operating some of the individual locks. These habitats may thus eventually become excellent areas for mollusks and small fishes.

Lithasia plicata Wetherby. Collections: 39 (1). Although not listed as Threatened or Endangered, this species is rare in Kentucky waters and probably deserves such consideration. It cannot withstand settleable-solid or acid-mine pollution. Unfortunately, most of the known Kentucky habitats lie in the middle of the Eastern Coal Fields.

Pleurocera canaliculatum (Say). Collections: 2 (5), 4 (1), 5 (1), 10 (1), 24 (1), 45 (11). Most of these specimens are of the morphological type listed under the subspecific designation *P. c. undulatum* (Say), except those from the Licking River. The population at Station 4 is large.

Pleurocera acuta Rafinesque. Collections: 7(1), 17 (1), 18 (1), 31 (2), 33 (2), 39 (1), 40 (21), 50 (2). *Pleurocera acuta* is listed as of Special Concern (Branson et al. 1981), although there is a healthy population at Station 45 in the Licking River. The species has nearly disappeared from localities where it was abundant (see Goodrich 1940; Call 1900).

Nitocris trilineata (Say). Collections: 45 (5). Since we made this

collection (1964) from the Licking River at Butler, a dam has started releasing very cold water through the habitat. In the spring of 1981 we were unable to find a single specimen of this handsome little snail at the locality. The species is listed as Threatened (Branson et al. 1981).

Goniobasis semicarinata (Say). Collections: 3 (7), 8 (17), 9 (2), 10 (31), 15 (31), 17 (14), 22 (32), 23 (12), 26 (30), 27 (8), 33 (2), 34 (45), 37 (1), 38 (9), 40 (1), 42 (7), 43 (49), 44 (1), 45 (51), 46 (21), 48 (35), 49 (1), 50 (6). This is the characteristic pleurocerid of the entire Kentucky and Licking River drainages, as well as of the Upper Salt River Drainage. Although not formerly reported from the Cumberland River drainage, there are many populations of pleurocerids there (particularly in the Little South Fork and the Rockcastle River) that are not separable by means of shell characteristics from those of the Licking and Kentucky rivers.

Goniobasis costifera (Haldeman). Collections: 11 (13), 12 (9), 13 (15), 14 (1), 25 (24), 36 (1), 41 (3). This species is only locally abundant in the Kentucky River drainage (Branson and Batch 1981).

Viviparidae

The distribution of viviparids is extremely poorly known in Kentucky, and practically nothing has been added since the papers of Clench (1962a, b), Clench and Turner (1955), and Clench and Fuller (1965). Two genera and three species are reported here.

Lioplax subcarinata occidentalis Pilsbry. Collections: 30 (1), 45 (1). The habitat at both sites was mud and rocks with rooted vegetation. Clench and Turner (1955) considered this a synonym of *L. sulculosa* (Menke).

Campeloma integrum (Say). Collections: 8 (3), 45 (1). This species was taken from mud at the base of water willow along the margins of riffles.

Campeloma crassula Rafinesque. Collections: 11 (1), 17 (3), 24 (1), 48 (1). Some of the older literature reported this species as *C. ponderosa* (Say).

Hydrobiidae

Pomatiopsis lapidaria (Say). Collections: 3 (1), 6 (1), 16 (2), 19 (1), 25 (3). Although most authors consider this species amphibious, the specimens from Station 16 were removed from dead leaves in the water. The others were found at the water's edge on wet soil and rocks.

PULMONATA: BASOMMATOPHORA

Other than the exceptions noted below, we basically follow the classification scheme of Taylor and Sohl in the Basommatophora.

Lymnaeidae

We follow the rationale of Hubendick (1951, 1978) in our treatment

of this family of snails. Distributional data for lymnaeids in Kentucky are sparse to lacking, particularly in the western half of the state.

Lymnaea columella Say. Collections: 21 (4), 44 (4). The specimens were taken from backwaters over mud bottoms, and most of them were heavily laden with fluke larvae.

Lymnaea palustris (Müller). Collections: 28 (3). Although the occurrence of this pond snail in Kentucky was implied by Baker (1911), this is the first record of its occurrence supported by definite locality data.

Lymnaea stagnalis Linnaeus. Collections: 28 (5). The pond from which these specimens were taken supports a large community of cool-water vegetation and attracts many migratory aquatic birds, which may account for the rather speciose snail population at this station. Aquatic snails, particularly young specimens, are easily transported in mud and plant debris on the feet of these birds. This species was heretofore unknown from Kentucky.

Lymnaea humilis Say. Collections: 3 (1), 28 (1), 29 (1). This is by far the most commonly encountered pond snail in Kentucky. The specimen from Station 3 is of the *obrussa* form.

Physidae

This family is badly in need of comprehensive monographic treatment. Many of the so-called species are doubtless ecotypes, and still other species probably await discovery by means of electrophoretic and other biochemical techniques. Identifications based on shell features alone, such as the three species reported here, are only tentative.

Physa heterostropha (Say). Collections: 22 (1), 28 (2).

Physa gyrina Say. Collections: 32 (5).

Physa integra Haldeman. Collections: 22 (3), 25 (3), 29 (23).

Ancylorhynchidae

We follow Hubendick (1978) in assigning this family name, which includes the Planorbidae and the Ancyliidae.

Bulininae: Physastrini

Ferrissia rivularis (Say). Collections: 44 (3), 45 (1). The specimens were removed from dead unionid valves in deep, swift riffles.

Bulininae: Camptoceratini

Helisoma anceps (Menke). Collections: 15 (1), 17 (2), 20 (6), 28 (2), 29 (17), 42 (1), 43 (1), 50 (1). In the eastern highlands of Kentucky, *Helisoma anceps* appears to be more common and abundant than the following species.

Helisoma trivolvis (Say). Collections: 21 (5), 22 (1), 25 (1), 28 (1), 29 (12), 47 (7), 48 (2). The principal habitats of this widespread species are lowland, mostly in vegetated backwaters over mud bottoms.

Planorbinae: Planorbini

Gyraulus parvus (Say). Collections: 29 (1). There are very few

published records for this and other small planorbid species, doubtless because of inadequate collecting in vegetated standing waters.

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